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5578199 US-PAT-NO:

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US 5578199 A DOCUMENT-IDENTIFIER:

TITLE:

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Apparetus for maintaining a stabble bath for an autodeposition composition by periodically separating particular metal ions from the composition

Description Text -

190 of this switch is depressed, the electrical connection between associated contacts "a" and "b" is broken, and the switch 8W5 mechanically maintains this position. Controller 127 is programmed to respond to the operation of the emergency stop switch 8W5 by first checking to see if the switch has been manually returned to its inoperative position by being pulled outpard, in which case if a treatment cycle had been interrupted, that cycle will be resumed from When the pushbutton described in detail below) will be reset except for outlet pressure low alarm 160, 160', high delta pressure alarm 161, 161', no pump flow alarm 164, 164', and valve failure alarm 163, 163'. Subsequently, if the "EMERGENCY STOP" switch SWS is deactiveted, controller 127 will then resume the cycle of operation previously interrupted, as mentioned earlier. where it was previously interrupted. However, if controller 127 determines that the "EMERGENCY STOP" switch SWS remains activated, system operation will be terminated, but the system will not be reset. Next, all alarms (to be Switch SWS is designated as an "EMERGENCY STOP" switch.

Detailed Description Text

Test Mode I provides for energizing lamp 160, and lighting backlit panel display 160', if used, for indicating "COUTER PRESSURE IOW". As previously explained, this alarm indicates that the pressure measured in the line between filter P2 and TV-I is low, meaning that the filter P2 is clogged and must be changed. The alarm is energized through sensing by controller 127 of the pressure signal PR2 changing state, such as going from +5 volts to zero volt, for example, indicating a low outlet pressure. The steps involved in this first test mode are as follows:

Detailed Description Text - DETX (204):

Note that as indicated above, for resetting visual alarms provided in the system, as discussed above, alarms associated with liquid levels of tanks Ti. TZ, and T3, if used, are automatically reset upon restoration of the level of liquid in the associated tank. However, pressure alarms are reset by first inectivation, followed by activation of the "EMERGENIX_STOP" switch 985. Also, the valve alarms can only be reset by placing the system in its inactive state, and servicing the valves, as indicated in the word flowcharts given above.

Current US Class - CLAS (2):

Omied States Patent [19]	[11] Patent Number:	٠.
Kozak et al.	[45] Date of Patent: *No	Ş
[54] APPABATUS FOR MAINTAINING A STABLE BABLE FOR MAINTAINING A STABLE COMPOGNITION	275537 8/1987 Japan. 62-193652 8/1987 Japan.	
SEPARATING PARTICITAR METALLIONS	OTHER PUBLICATIONS	2

5,578,199

*Nov. 26, 1996

SEPARATING PARTICULAR METAL 10NS FROM THE COMPOSITION

Inventors: William G. Kozzk, Hatfield; Joseph C. Topping, North Wales, both of Pa. 2

90-94, 96-98).

Assignee: Heakel Corporation, Plymouth Meeting, Pa. Ē

F. N. Kemmer et al., "The Naico Water Handbook", McGraw-Hill (NY), 1979, section 12, pp. 1–37 (esp. pp. 1, 7–8, 17–18, 20, 25–26, 30).
"Best Handbook of Industrial Water Conditioning", Eighth Edition, 1980, Best Laboratories, inc., Trevose, PA 19047, pp. 377–381.

Nactod, "Ion Exchange—Theory and Application", Acaminic Press (NY), 1949, pp. 77–99 (esp. pp. 78–80, 85–87,

The portion of the term of this patent subsequent to Jan. 26, 2013, has been disclaimed, Notice: Ξ

Appl. No.: 231,075 **2 3**

Nov. 7, 1994 E E

Assistant Examiner—Prancis J. Lonin Mitomey, Agent, or Firm—Ernest G. Szoke; Wayne C. Jarschke; Kenneth Watov

A system automated for providing at least periodic removal of metal ions and contaminants from a chemical bath,

ABSTRACT

Waterworks"; Siemene Review, vol. XLV, pp. 17-21, 1978.

Primary Examiner-Michael W. Bell

Stefan Muller, "Process Control of the

Related U.S. Application Data

Division of Ser. No. 8,956, Jan. 26, 1993, Pat. No. 5,393, 416. <u>8</u>

..... BO1J 47/02; BO5D 1/18; 耳口。 52 [51]

U.S. Ct. 210749; 2107167; 2107143; 2107167; 210728; 204/480; 205/99; 118/602; 118/405; 118/429 [38]

Fleid of Search 210062, 670, 210067, 681, 88, 89, 108, 138, 142, 143, 3.63, 265, 729, 275, 900, 96.1; 118/600, 602, 400, 429

comists of a microprocessor programmed for controlling find derivatis of purions and very, for in one state of operation circulating a first practicamizing quantity of the operation circulating a first practicamized quantity of the chemical best from a second state of operation circulating desionized water from a second state of operation circulating desionized water from a second state of operation of cruitating resistant electrical best between for return to the first tasts; for in a third state of operation circulating desionized water through the IEX column and districting the thirs weater from a water port; for in a fourth state of operation circulating desionized water through the IEX column and districting the thirs weater from a water port; for in a fifth state of operation circulating desionized water through the IEX column for districting desionized water through the IEX column for districting desionized water through the IEX column for districting elements best into the IEX column for districting elements best into the IEX column for displacing column that the column for displacing column that the column for displacing columns the first column for displacing columns that the columns

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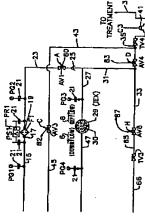
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Const. 4/1991 7/1973 5/1982 2017026 00236.55 0079197

11 Claims, 4 Drawing Sheets

circulating chemical bath into the IEX column for displacing residual time water therefrom, and discharging the same out of the water port, in preparation for a cycle of treatment of the chemical bath.



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be resumed from which where it was previously interrupted. However, if controller 127 determines that the "EMERGENCY STOP" switch SW5 remains activated, system operation will terminated, but the system will not be reset. Next, all alarms (to be scribed in detail below) will be reset except for outlet pressure low elarm), 160', high delta pressure alarm 161, 161', no pump flow alarm 164,164', a valve failure alarm 163, 163'. Biosequently, if the "EMERGENCY STOP" (tch 8W5 is deactivated, controller 127 will then resume the cycle of 5 outward, that cycle will pulled being operation previously interrupted, as mentioned earlier. position by a treatment cycle had been interrupted, to its inoperative returned scribed in case if switch

Description Text - DETX (128): Detailed

changed. The alarm is energized through sensing by controller 127 of the pressure signal PR2 changing state, such as going from +5 volts to zero volt, for example, indicating a low outlet pressure. The steps involved in this Test Mode 1 provides for energizing lamp 160, and lighting backlit panel display 160', if used, for indicating "OUTER PRESSURE LOW". As previously explained, this alam indicates that the pressure measured in the line betwee filter F2 and TV-1 is low, meaning that the filter F2 is clogged and must be first test mode are as follows:

Description Text - DETX (204): Detailed

Note that as indicated above, for resetting visual alarms provided in the system, as discussed above, alarms associated with liquid levels of tanks T1. T2, and T3, if used, are autematically reset upon restoration of the level of liquid in the associated tank. However, pressure alarms are reset by first inactivation, followed by activation of the "EMERGENCY STOP" switch SWS. Also, the valve alarms can only be reset by placing the system in its inactive state, and servicing the valves, as indicated in the word flowcharts given above.

claims Text - CLTX (46):
 said controller means being responsive to said first pressure signal, for
 generating a first alarm signal, and completing said first or second states of
 operation, if either is operative, and inhibiting further states of operation
 until the differential pressure problem is corrected; and

CLTX (47): Claims Text

first alarm means responsive to said first alarm signal, for producing an alarm indicative of the pressure problem to alert an operator to take necessary

said controller means being responsive to said second pressure signal for generating a second alarm signal, completing said first or second states of operation, if either is operative, and inhibiting further states of operation and until proper pressure is restored; ims Text - CLTX (50): said controller means being

- CLTX (51): Claims Text

second alarm means responsive to said second alarm signal, for producing an alarm indicative of the undesirable reduction in outlet pressure.

Patent Number: Date of Patent: Ξ [61] United States Patent Kozak et al.

5,554,276

Sep. 10, 1996

APPARATUS FOR MAINTAINING A STABLE BATH FOR AN AUTODEPOSITION COMPOSITION BY PERUDICALLY SEPARATING PARTICULAR METAL IONS FROM THE COMPOSITION 54

Inventors: William G. Kozak, Herfield; Joseph C. Topping, North Wales, both of Pa.

23

E Nachod, "Ion Exchange—Theory And Application", Academic Press (NY), 1949, pp. 77–99 (esp. pp. 78–80, 85–87, 90–94, 96–98.

B. Kemmer et al., "The Nalco Weier Handbook", McGraw-Hill (NY), 1979, section 12, pp. 1–37, (esp. pp. 1,

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Assignee: Henkel Corporation, Plymouth Meeting, Pa. E

Appl. No.: 452,926

7-8, 17-18, 20, 25-26, 30.
Serfan Muller, "Process Centrol of the Grosshansdorf Naturwats", Sieners Review vol. XLN, pp. 17-21, 1978.
"Analytical Merhods And Equipment", Berg Handbook of Industrial Water Conditioning: Bighth Edition, 1980, pp.

Primary Examiner—Joseph W. Drodge Attorney, Agent, or Firm—Emest G. Szoke; Wayne C. Jesschker, Kenneth Wetov

A system automated for providing at least periodic removal of metal ions and contaminants from a chemical bath, consists of a microprocessor programmed for controlling circuits of pumps and valves, for in one state

ABSTRACT

May 30, 1995 Piled: E

Related U.S. Application Data

377-381.

Division of Ser. No. 231,075, Nov. 7, 1994, which is a division of Ser. No. 8,956, Isn. 26, 1993, Pat. No. 5,393,416. **2**

BOLD 17/12; BOID 24/45 Let. Cl.* U.S. Cl. [52]

205/101; 210/134; 210/141; 210/167; 210/269 Field of Search [58]

of Search 21095, 87, 90, 21095, 87, 90, 21095, 114, 142, 143, 167, 571, 238, 239, 662, 677, 678, 275, 134, 269, 1015, 2059, 1015, 137, 427345

References Cited

[36]

operation circulating a first predetermined quantity of the chemical bath from a first track, through an ion exchange column, and back to the first tank, for in a second state of operation circulating claigned water from a second and time the IEX column for displacing residual chemical bath therefrom for return to the first tank; for in a third state of operation circulating claimed water through the IEX column, and discharging the rhase water from a water port; for in a fourth state of operation circulating claimed water from a water port; for in a fourth state of operation circulating tragenerate soid 210/96 230/662 1187 U.S. PATENT DOCUMENTS Carlson et al. 2/1953 2,628,191 2,938,868 3,220,552 3,246,759 3,312,189 3,383,310 3,581,894 3,791,431 3,839,697

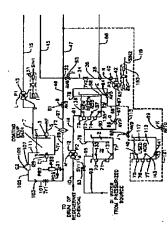
through the ion exchange column, and discharging the used acid from a waste port; for in a fifth state of operation circulating desonized water through the IEX column for ninsing acid regenerate therefrom and discharging the same out of a waste port; and for in a sixth state of operation circulating chemical bath into the IEX column for displacing residual riuse water therefrom, and discharging the same out of the waste port, in preparation for a cycle of treatment of the chemical bath.

(List confined on next page.)

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Canada . Japan . 471991

16 Claims, 4 Drawing Sheets



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5234563 US-PAT-NO:

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US 5234563 A DOCUMENT-IDENTIFIER:

Electrolytic ionized water producer of a continuous type

3900

TITLE:

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adhere to the other electrode causing a reverse effect, so that a specified total quantity of water to be supplied is set, and when the quantity of water tackhes the set value, even while water is being supplied, the polarity of the applied voltage is reversed for scale removing operation, and the water supply is stopped issuing an alarm to the user. Therefore, even when a small quantity of water is needed, the user is required to perform a complicated operation reversal of polarity is mixed with the alkaline ionized water. The reverse energizing period of time for the reversal of polarity depends on the period of time till a user stops using water, so that it is difficult to secure a fixed period of time for reverse energizing operation. Therefore, trouble can occur by the uncertain period of time for reverse energizing operation. There another problem that since the ionized water producer is provided with a again. Since the polarity is automatically reversed while water is being supplied, if the operation is stopped late, acid ionized water generated by the pressure switch as a means for integrating the quantity of water, and an alarm such as to stop supplying water once and after that to start supplying water In the case of conventional apparatus, when scale is being removed, if the energizing period of time in the reverse polarity is too short, a sufficient rinse is not performed, and if the period of time is too long the scale can on the configuration can be a complicated one. Brief Summary Text - BSTX (8): and so can be neans,

Current US Class - CLAS (1):

5,234,563

scale can be removed properly in every water supplying

BRIEF DESCRIPTION OF THE DRAWINGS

connection with the accompanying drawing whereb:
FIG. I is a achematic representation abowing the
outline of the whole system of an embodiment of a Other features and advantages of the invention will be apparent from the following description taken in

continuous type electrolytic ionized water producer 10 seconding to the present invention.

FIG. 2 is a block diagram showing a control system of an embodiment of a continuous type electrolytic ionized water producer seconding to the present inven-

FIG. 3 is a chart showing the time chart of the opera-tion of ionized water production and the scale removing operation.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

positive electrode and a negative electrode on the DC voltage output ade of the rectifier circuit 19 are connected to 2 moveble contacts, 22a and 23s, of a relay 21 for reversing polarity through a smoothing capacitor.

20, A fixed cominer Zb, which is 1 of 2 fixed cominer,

21b and Zb, of the moveble contact Zb of the positive
electrode is connected to the positive electrode is connected to the positive electrode is connected to the positive electrode is connected to the positive electrode is connected to the againve electrode 4. A face contact 23b, which is 1 of 2 face contacts, 23b and 23c, of the movable contact 23c of the negative electrode is connected to the negative elec-ON or OFF responsive to an output algues of a control circuit 30, and a fuse 17, and the secondary aide of the transformer 18 is connected to a rectifier circuit 19. A the positive electrode 6. These 2 movable contacts, 22s and 23c, normally abut the fixed contacts 22b and 23b,

as shown in the drawing, under the force of a spring, and they are switched to the reverse connecting positions sbutting the opposed faced contacts, 22c and 22c,

by a reversing signal from the control circuit 30.

The control system of the control circuit 30 will be explained based on FIG. 1. The control circuit 30 comergations

An embodiment according to the personn invention will be explained based on the drawingn in the follow ing. He couline to the whole of a combinous type electrolytic basined water producer will be explained beased on the drawingn in the follow ing. It is an intext pipe for introducing drawing in the follow water supply detection again, and combine on FIG. 1. In FIG. 2. In FIG. 3. In prises a water supply detection means 31, a zero thou water supply detection means 32 and an integration water supply detection means 32 and an integration water supply detection means 31 detects a water supply when a signal from the flow rate sensor 10 is input ordinatorally for a fixed time, and the water supply detection means 31 detects as water supply when a signal from the flow water supply and zero flow, water supply faring means for integration means for integrating the water supply of an integration means for integrating the water supply for integrating the water supply for supply detection signal if the input of a water supply detection signal supply supply and zero flow, water supply detection signal supply supply to the period of time for means for integrating to the water supplying operations. A signal supply supplying period of time, T, and a scale removing period of time, T, and a scale removing period of time, T, as long, and a scale removing period of time, T, as long, and a scale removing period of time, D, is sponding to the water supplying period of time, T, as long, and a scale removing period of time, D, is setting supplying period of time, D, is opinitied for every water supplying period of time, T, as long, and a scale removing period of time, D, is set united as served to the water supplying period of time, D, is spiniting only the water supplying period of time, D, is set united as served water supplying period of time, D, is set using a section of time, D, is set using a section of the water supplying period of time, D, is set using a section of the water supplying period of time, D, is set using a section of time, D, is set using a section of the water supplying period of time, D, is set using a section of the period of time, D, is ing operation, and a fluithing algual is input to the water supplying period of time integration means 34 and the memory is reset. signal is stopped inputfug continuously for a specified period of time, it judges the conclusion of scale remov-S

On the other hand, as a measure for the case where water is supplied during a scale removing operation, the 60 control circuit 30 comprises a detection means for dewater supply detection means 31 and a reverting algoral from the judgment means for judging the finish of a scale temoving operation 37 are imput, and if a vater supply detection again is input during a period of time in which a reversing algoral is being output, a signal for water supply during a scale removing operation is gentecting water supply during a scale removing operation 38 in which a water supply detection signal from the

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4852385 US-PAT-NO:

DOCUMENT-IDENTIFIER: US 4852385 A

Maintenance device for at least partially automatic cleaning and calibration of a probe containing a measured value transmitter

KWIC

Description Text - DETX (12): Detailed

98 which constitutes a toggle switch in the illustrated embodiment. Drating operation is started by actuating the control element 102 which Ive 56, which is set to rinsing or cleaning duration of about 1 control valve in the control unit A3, is opened; the RINSE In addition, the ng operation is restarted. This procedure is recommended, for when the electrode is intended to be stored in the clean condition at the rinsing The electrode remains immersed If the rinsing or cleaning Thereafter, the rinsing or cleaning operation must be repeated. WION" program or calibrating operation is blocked during the time of heavy contamination. If the rinsing or cleaning operation or intended to be repeated, the toggle switch 90 must be placed into intion and thereafter back to the CM position, whereupon the rinsin The directional The setting of the rinsing or the rinsing or cleaning water pressure is cleaning operation or process can be repeated once or several er after the rinsing or cleaning operation. If the rinsing or clea pressure is insufficient, the red alarm indicator 116 is activated or cleaning operation is started by actuating the control duration to about 1 minute corresponds to the general rule; or cleaning period can be prolonged if necessary. in the illustrated embodiment. the rinsing or cleaning water pressure is insufficient. the end of the monitored fermentation process. (blue) is activated thereby. the case of heavy contamination. toggle switch OFF position and "CALIBRATION" the rinsing ringing or water indicato exemple,

sor from the container containing the measured medium. In addition, this combination, in which all functions accessary for carrying our the maintenance can be halisted and/or controlled by pre-main signals, permiss as least partial automation of the maintenance.

G01N 27/30, G01N 27/38; G01D 18/00 73/1 Rt 204/401; 204/408 204/408, 433, 403, 1 H, 1 T

[58] Field of Search

[52] 'U.S. Ct. ... [51] Int. Ct.

11 Claims, 4 Drawing Sheets

- CLAS (1): Current US Class 204

5	United States Patent [19]	[11]	[11] Patent Number: 4,852,385
ᇤ	Brinkmann	[45]	[45] Date of Patent: Aug. 1, 1989
35	MAINTENANCE DEVICE FOR AT LEAST	[36]	References Cited
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[7]	[75] Inventor Hains J. Brinkmann, Frankfurt am Main, Fed. Rep. of Germany	867	17.98 5.798
i		E	FOREIGN PATENT DOCUMENTS
Ē	[73] Axignee: Dr. W. Ingold AG, Urdorf, Switzerland	2514193	193 1/1976 Hed. Rep. of Germany
[12]	[21] Appl. No.: 15,889	2712159	159 9/1978 Fed. Rep. of Germany . 771 11/1982 Fed. Rep. of Germany .
8	PCT Filed: May 28, 1986		OTHER PUBLICATIONS
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;	§ 371 Date: Jan. 27, 1987		ratent rubitement 3/-13/033 dated Aug. 16, 1982).
	§ 102(e) Date: Jan. 27, 1987	Arromey,	Primary Examiner—Tom Noland Aroney, Agent, or Firm—Werner W. Kleeman
[87]	[87] PCT Pub. No.: WO86/07151	[23]	ABSTRACT
	PCT Pub, Date: Der. 4, 1986	The comb	The combination of a measured value transmitter unit, a metering unit and a control unit enables all maintenance
2	Foreign Application Priority Data	meseures	measures which become necessary during the course of
X	May 30, 1965 [CH] Switzerland	diture of 1	diture of labor and time and without removing the sen-
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METERING UNIT

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alarms)	Paqes Title	6 High vol			0 Apparat stable	8 Pressure switch	G	15 Recovery of metal values from manganese deep sea	7 CONTINUOUS ANALYSIS FOR COPPER CONCENTRATION			
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5425385 US-PAT-NO:

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US 5425385 A DOCUMENT-IDENTIFIER:

Rotary washer spraying system

TITLE:

Text - ABTX

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particularly for plastic returnable bottles automatically regulates each process of the wash spraying system, namely, sequentially feeding bottles from maintains, manages, and controls all pumps, valves, solenoids, and drive motor speeds as required by the process, and also provides for monitoring and adjusting fluid levels, alkalinty/caldity concentrations, and temperatures of the wash and neutralizing solutions. Alarm conditions that may present flagged for human intervention, interaction, or acknowledgement. Such alemnender conditions are out of range: fluid flow, temperature, pressure, conductivity and/or pH, fluid levels, and carousal and bottle RPM. The control system also includes specialized checks for clogged spray nozzles, and out of position inverting them by a worm/inverter means, receiving and simultaneously rotating each bottle in an inverted position through a plutality of washing, neutralizing and sanitizing treatment zones, and inverting each bottle to its original neck-up orientation for further processing. During the entire process, a programmable logic controller themselves during the washing, neutralizing, and sanitizing processes are a high-speed infeed conveyor means, control system for fluid lances.

Brief Summary Text - BSTX (8):

During the entire process, a programmable logic controller maintains, nages, and controls all pumps, valves, solenoids, and drive motor speeds as quired by the process, and also provides for monitoring and adjusting fluid rels, alkalinity/acidity concentrations, and temperature of the recirculated or acknowledgement. Such alarm conditions are: out of range, fluid flow, temperature, pressure, conductivity and/or pH, fluid levels, carousel and bottle RPM, and will include specialized checks for clogged spray nozzles, and wash solution. A machine operator or attendant may view from a centrally located operator interface, all of the above present machine operating and process parameters. Any alam conditions that may present themselves during the process are displayed and will prompt for human intervention, interaction, RPM, and will include position fluid lances. required by manages, oŧ evels,

Current US Class - CLAS (1):

3 United States Patent Kuta et al.

5,425,385 Jun. 20, 1995 Patent Number: Date of Patent: Ξ 5 134/66 635493 9/1936 Octmany

Ken Kata, Rockford, III.; Antonio Fernandez, Danbury, Com.

Inventors:

Assignee: PepsiCo. Inc., Purchse, N.Y.

[2] 2

rotary washer spraying system

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Prinary Examine—Philip R. Coc Attorney, Agent or Firm—Scully, Scott, Murphy &

ABSTRACI

3, CL. 134/59,

BOARS 3/402; BOSB 9/708

U.S. CL

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Jul. 12, 1993

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Appl. No.: 90,595

134/104.1; 134/113; 134/142; 134/152; 134/133; 134/139; 134/139; 134/139; 134/54; 57 R., 38 R., 65, 60, 95.2, 95.3; 103.3; 104.1; 113, 142, 144, 145, 152, 153, 159; 239/71;

[58]

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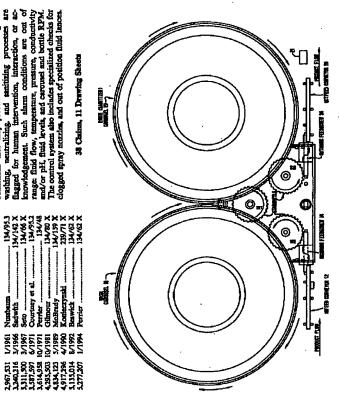
56

ing system designed particularly for plastic returnable bottles automatically regulates each process of the ward proving system, namely, sequentially feeding bottles from an infect conveyor means, trevering them by a worm/inverter means, receiving and fainthancously rotating area dimitationally rotating each bottle in an inverted position through a plurality of weating, neutralisting and sanitizing treatment arones, and inverting each bottle to its original neet-up onleration for further processing. During the entire process, a programmable logic countroller main-bank manages, and counted all pumps, valves, soll-holds, and drive motor speeds as required by the process, and also provides for monitoring and adjusting fluid levels, altalitify/sedify concentrations, and meperatures of the weak and neutralizing solutions. Alarm conditions that may present themselves during the washing, neutralizing, and sanitizing processes are lagged for human intervention, interaction, or ac-knowledgement. Such alarm conditions are out of range fluid flow, temperature, pressure, conductivity mand/or pH, fluid levels, and carousel and bottle RPM. The control system sho includes specialized checks for clogged spray nozzles, and out of position fluid lances A control system for a high-speed rotary washer spray

38 Claims, 11 Drawing Sheet

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purtney et al.



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Continuous washing system

connecting lines 453A and 453B as shown. In this way, all of the detergent jets 330, 332, 334, 336 and 338 which are connected to the first and second wash lines 448 and 452, are all supplied with a mix of water and detergent Prior to passing out to the various detergent jets 330, 332, 334, 336 and 336, the heated water containing detergent in both the first and second lines 449 wash lines 448 and each other via the first and second second the first and are connected to In the **4** 10 29 २००८८८५**५**००<u>४६</u>७ আः⊞⊞⊞⊞⊞⊞

water reservoir 126 so that there is sufficient water to flow through the pumps (P1) 136 and (P2) 138, or adjusting the pitch of the trailer 210 itself so that sufficient water is running off from the various water jets into the water reservoir 126. In one embodiment, the first and second low pressure switches (LP1) 140 and (LP2) 142 are set to be activated at a pressure of about 30 psi and to be deactivated at a pressure of about 50 psi. higher predetermined value. Specifically, if the water pressure is below the predetermined value, an indicator light on the system controller 114 will light and 452, preferably passes through a first low pressure switch (LPI) 140 and a second low pressure switch (LPZ) 142, respectively, set to activate the appropriate indicator on the system controller 114 when the pressure is below a predetermined value and to turn off the indicator when the pressure is above a ö Such remedial measures can include adding additional water to the (P2) 138, up, or an alarm will sound, warning the operator that the pressure inadequate in either the first pump (P2) 136 or the second pump (P2) both, so that the operator can turn off the affected pump and take measures.

Current US Class - CLAS (1):

3 # 23

United States Patent [19]	[11]	Patent Number:	5,993,73
Lyon	[45]	[45] Date of Patent:	Nov. 30, 199

8 83 |

CONTINUOUS WASHING SYSTEM

Inventor: Larry R. Lyon, Waukee, lows [75] Ē

134/123 134/123 134/123 134/123

Des Moines

Business Record, 1 page, (Mar. 31, 1997) No Page Number

Primary Examiner-Robert J. Warden, Sr.

Edginton, D., "Adventures of an Idea Man" OTHER PUBLICATIONS

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7/1991

Assignee: Chaircare, Wankee, Iowa

Appl. No.: 08/960,156 [7]

Oct. 29, 1997 Filed:

422105; 422/107; 422/111; 422/292; 422/300; 422/305; 134/72; 134/12; 134/103; 134/99.2; 134/18; 134/26; 134/29; 134/32; 134/15; 134/36; 134/37; 422/31; 422/3; 422/28; Et.C. U.S. Cl. <u>8</u> [51]

Field of Search 422/105-111, 292, 297, 300, 304; 134/72, 123, 111, 108, 992, 18, 26, 29, 32, 34, 42, 15, 36, 37, 30, 15/63 [28]

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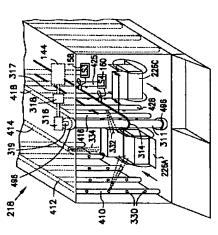
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Attorney, Agent, or Firm-Schwegman, Woessart & Khith PA ABSTRACT

spray the objects with a mixture of detergent and water to remove associated foreign materials until shortly after the objects make a U-turn. At this point, the objects are first continuous basis. In one embodiment, the apparatus of the present invention is a mobile, self-contained system in sprayed with a mixture containing a rinse agent and water, then with a spray containing disinfectant and water. The objects are thereafter dried by suitable drying means such as which objects are cleaned and sanitized as they travel in a Ushaped path within a wash chamber. As the objects enter the first side of the wash chamber, suitably located water jets a high velocity air curtain system. The contimous washing system of the present invention preferably has a selfcontained water heaver to pre-heat the water prior to its being sprayed onto the objects. The system preferably also that a recycling path wherein water which has been sprayed onto recycling path wherein water which has been sprayed onto the objects is collected and filtered in a water reservoir prior method for cleaning objects such as wheelchairs on present invention provides a low-cost and to being used again in the system.

28 Claims, 12 Drawing Sheets



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Dish machine monitoring of time, temperature, alkalinity, and pressure parameters

Detailed Description Text - DETX (20)

While not shown in FIG. 2, the control box may conveniently contain means for determining the existence of flow pressure in the fill line to the washing machine. This may be accomplished conveniently by having a flexible plastic tubing from the fill line to a pressure switch located in the control box. A pressure switch designated M2218-4 manufactured by the Hobbs Division of statisfactory for this purpose. The pressure switch may be electrically connected to the elem system or the face of the control box as shown in FIG. 4. When the pressure switch may be electrically connected to the elem system on the face of the control box as shown in FIG. 4. When the pressure switch sanses the presence of water flowing in the fill line and the system is operating a light will be turned on on the front of the control box. Alternatively, the pressure switch may be located at the fill line itself, rather than in the control box, and electrically connected with the light on the face of the control box to indicate water flowing in the fill line. The pressure setting for activating the switch is variable between fill switch activation at between one-half and three-fourths psi.

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Detailed Description Text - DETX (22):

F. The probe 112 of thermostat Pressure only when the wash cycle is operating in station 16. Sample water in line enters mixing manifold 56 through fitting 108 into port 109 and into chamber the presence of water flowing in line 57. When water stops flowing in e.57 or a low pressure condition occurs while pump 26 is running, pressure tch 102 activates an alarm system. The alarm system consists of a light on tering mixing manifold 56. Pressure switch 102 senses, through plastic tube the face of the control panel (FIG. 4) as well as a bell to call immediate attention to the operator that water is not being pumped by pump 26. Lack of pressure in line 57 indicates that there is no water in tank 28 or that excessive foam in tank 28 is such that pump 26 is unable to maintain the water pressure required for efficient operation of the dishwashing machine. Pressurv switch 102 is electrically connected through wires 106 and 107 to the bell and signal light when the temperature of sample water falls below a predetermined level. Conveniently, then the temperature of sample water falls below a predetermined level. The alarm does not sound when the machine is turned off, from the sample water Electrode 64 is ve-containing wash water from tank 28 (FIG. 1) is taken off through line 57 at the outlet from pump 26. Referring to FIG. 3, line 57 FIG. 3 is a cross section of mixing manifold 56 illustrated in FIG. 2 Probe 112 is connected by wire 61 to a sensitivity circuit previously described. The electrode 64 extends into chamber 111 through fitting 113. Blectrode 6 connected to a sensitivity circuit through wire 63 in order to measure In chamber 111, the sample water is tested for temperature and 59 also functions as the anode for determining alkalinity. sample line 57 at the outlet from pump 26. Referring preferably has a filter 101 to remove large particles Conveniently, that level is 150.degree. activates an alarm system. f the control panel (FIG. 4) alarm system. alkalinity. Additi

atent [19]	
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United (Robinson

 [54] DISH MACHINE MONITORING OF TIME, TEMPERATURE, ALKALINITY, AND PRESSURE PARAMETERS
 [76] Inventor: Norman R. Robinson, 6902

58/145 R 134/58 D 134/18

Widegren

Gore et al...

5/1965 10/1968 1/1970 5/1972

3,896,827 July 29, 1975

[11]

Inventor: Norman R. Robinson, 6902 Brighton Dr., Dublin, Calif. 94566

Filed: Aug. 31, 1973 Appl. No.: 393,345

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51] Int. CL. B08b 3/10 58] Field of Search. 134/18, 10, 25 A, 25 R, 58 134/29, 30, 32, 57 D, 58 D, 72, 56 D, 48, 477, 58/145 R

| References Cited UNITED STATES PATENTS

[57] ABSTRACT
A dishwasher control system for automutically record-

Assistant Examiner-Richard V. Fisher Attorney, Agent, or Firm-Limbach &

Primary Examiner-S. Leon Bashore

ing the duration of machine operation to determine cost of supplies, service and use. Machine operation is commenced by sensing the pressure of dishes and stopped automatically at the end of the cycle. During operation, the wash water is continuously sampled and checked for low temperature, low detergent and low pressure.

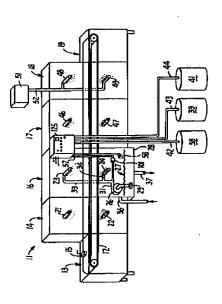
13 Claims, 4 Drawing Figures

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USPAT Kind Codes Þ 12 us 6274009 B1 2 VS 6274009 B

6274009 US-PAT-NO:

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See image for Certificate of Correction us 6274009 B1 DOCUMENT-IDENTIFIER:

Generator for generating chlorine dioxide under vacuum eduction in a single pass

TITLE:

Summary Text - BSTX (24): Brief

(4) monitoring the motive water feed. Pressure gauge (3) and pressure switch (4) monitoring the motive water pressure and provide an alam signal for undesirable pressure conditions. Conduit line (5) rive from

eductors (9) and (10). Catholyte and anolyte effluents are educted from the electrolytic cell through plastic tubings (13) and (14), respectively. The anolyte effluent tubing (14) and (14), respectively. The horizontal sections, to the inlet of anolyte eductor (10) so as to minimize the possible formation of gaseous pockets of chlorine dioxide. Such pockets are potentially explosive. Non-corrosive check valves (15) and (16), respectively, are present on the catholyte and anolyte tubings (13) and (14), respectively, to prevent back flow through the electrolytic cell and prevent indivertent over hydraulic pressurization of the cell. Optional sample taps are typically located on the catholyte and anolyte discharge lines as illustrated. Inline (4) to the electrical panel shown in FIG. 6. Solenoid (6) is connected to motive water line (1). Conduit line (7) runs from solenoid (6) to the electrical panel shown in FIG. 6. Union (8) joins the catholyte eductor (9) and anolyte eductor (10). Eductor (9) and (10) create sufficient vacuum to draw the catholyte and anolyte flows through the electrochemical cell. Inline ball check valves (11) and (12), respectively, prevent back flow through

Current US Class - CLAS (1)

United States Patent Krafton et al. (12)

S Date of Patent: 65 £

6,274,009 B1 Aug. 14, 2001

Patent No.:

GENERATOR FOR GENERATING CHLORINE DIOXIDE UNDER VACUUM EDUCTION IN A SINGLE PASS £

Inventors: Brian D. Kraffen, Wakefield, RI (US), John C. Smedley, Plate Woods, MO (US) ନ

International Dioxide Inc., North Kingston, RI (US) Assigne: E

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days. Notice: €

Appl. No.: 09/389,335 3

Sep. 3, 1999 Filed: 3

C25B 15/00; C25B 11/00; Int. Ci. (51) ... **204/230.2**; 204/257; 204/284; 204/290 R; 204/290 F; 204/293 U.S. C. (22)

204/284, 290 R, 290 F, 293 Field of Search S8)

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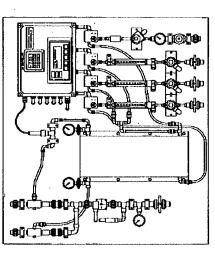
ing, Anaheim, CA Apr., 1996.

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Kelley; mi (74) Attorney, Agent, or Firm-Margaret Clifford Chance Rogers & Wells, LLP Primary Examiner-Donald R. Valentine · cited by examiner

resistant highly conductive cathode, and a cation ion exchange membrane between the anode and cathode. An eductor is used on the anolyte effluent line to create a vacuum and draw the analyte through the cell. Preferably, an eductor is used n the catholyte effluent line. Ascending analyte effluent line with a non-corrosive check valve leads monitor the composition of the anolyte efficient and/or the anolyte feed. A vacuum operated electrolytic generator producing a solu-tion of chlorine dioxide from a buffered aqueous alkali metal chlorite solution in one pass through the cell is disclosed. The cell contains a high surface area anode, a corrosion-

19 Claims, 9 Drawing Sheets



104/195 73/1 R X 356/442

Aug. 1, 1989

4,852,385

Patent Abaraces of Japan; vol. 6, No. 229, (1107) p. 155; published Nov. 16, 1982; (English Abstract of Japanese Perent Publication 57-132053 dated Aug. 16, 1982). The combination of a measured value transmitter unit, a metering unit and a control unit enables all maintenance measures which become accessary during the course of tions necessary for carrying out the maintenance can be inhisted and/or controlled by pneumatic signals, permits at least partial automation of the maintenance. process monitoring, to be carried out with little expenditure of labor and time and without removing the sensor from the container containing the measured me-dium. In addition, this combination, in which all func-FOREIGN PATENT DOCUMENTS Primary Examinar—Tom Noland Anamey, Agent, or Firm—Wenner W. Kleeman U.S. PATENT DOCUMENTS 25154193 1/1976 Fed. Rep. of Germany 2557542 6/1977 Fed. Rep. of Germany 2712159 9/1978 Fed. Rep. of Germany 3115771 11/1982 Fed. Rep. of Germany 3,623,830 12/1971 Arrhigton 4,25(1950 4/1981 Batchen et al. 4,299,495 11/1981 Sawahara et al. 4,399,432 11/1981 Sawahara et al. 4,334,232 6/1982 Moritz OTHER PUBLICATIONS 11 Claims, 4 Drawing Sheets ABSTRACT Patent Number: Date of Patent: METERING UNIT Ξ 3 36 5 MAINTENANCE DEVICE FOR AT LEAST PARTIALIT AUTOMATIC CERAING AND CLIBRATION OF A PROBE CONTAINING A MEASURED VALUE TRANSMITTER 22/0/23 . 73/1 Rt 204/401; 204/408 204/408, 433, 403, 1 H, 1 T GOLN 27/30, GOLN 27/38, Inventor: Heins J. Brinkmann, Frankfurt am Main, Fed. Rep. of Germany 3 Dr. W. Ingold AG, Urdorf, Switzerland Foreign Application Priority Data PCI/CH86/00070 United States Patent May 28, 1986 Jan. 27, 1987 W086/07151 Jan. 27, 1987 Dec. 4, 1986 Switzerland 15,859 PCT Pub. Date: PCT Pub. No.: [58] Field of Search May 30, 1985 [CH] § 102(e) Date: PCT Filed: § 371 Date: Appl. No.: [52] U.S. Cl. Assignee PCT No.: Int. C. Brinkmann 7 E Ē 12 **9** <u>[8</u> Ē 못 USPAT USPATcimence device for at least partially automatic cleaning and calibration of a probe containing a measured value transmitter which constitutes a toggle switch in the illustrated embodiment. The directional water control valve 56, which is set to tinsing or cleaning duration of about 1 rinsing or cleaning operation or process can be repeated once or several times in the case of heavy contamination. If the rinsing or cleaning operation or the rinsing example, when the electrode is intended to be stored in the clean condition at The electrode remains immersed water after the rinsing or cleaning operation. If the rinsing or cleaning repressure is insufficient, the red alarm indicator 116 is activated and rinnes to be activated until the rinsing or cleaning water pressure is cased. Thereafter, the hipsing or cleaning water pressure are cased. Thereafter, the hipsing or cleaning operation must be repeated. "CALIBRATION" program or calibrating operation is blocked during the time process is intended to be repeated, the toggle switch 98 must be placed into the QPP position and thereafter back to the QN position, whereupon the rinsis or cleaning operation is restarted. This procedure is recommended, for Kind Codes unit A3, is opened; the RINSE rinsing or cleaning period can be prolonged if necessary. In addition, insing or cleaning operation is started by actuating the control 98 which constitutes a toggle switch in the illustrated embodiment. minute by a time control valve in the control unit A3, is opened; the RINS indicator 115 (blue) is activated thereby. The setting of the rinsing or cleaning duration to about 1 minute corresponds to the general rule; howev calibrating operation is started by actuating the control element 102 Man Bo 최단AST Browser - L18: L2) 14 or 15 or., 1US 4852385 A 17 og: S I Doc: 2/2 ISORTED I Format: KWIC [ED] EG VGG», IGA VGGG# EG57ペデス rinsing or cleaning water pressure is insufficient. Δ С the monitored fermentation process. DOCUMENT-IDENTIFIER: US 4852385 A ш L Ĺ 4852385 Document ID of Pages Ξ: Description Text continues to be activated 12 Current US Class - CLAS KWIC US 4852385 us 6274009 the end of US-PAT-NO: Detailed Water 204 **₽** ₽ ®<u>B</u>B & ß 300

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US-PAT-NO: 4652368	1/1955 11/1955 WITTOM 1/1974 AVENTOR	
DOCUMENT-IDENTIFIER: US 4652368 A	1,521,658 12/1978	2167.67
TITLE: Water filtration system	[22] Flikkii Juleo 4342,81 12/1923 Kasanda Anton Busanines—Briest G. Therlenn	10V167
SIMX	Related U.S. Application Data Attorney, Agent, or F	Thomas
	[63] Continuation of Ser. No. 664,673, Aug. 29, 1944, htm. 1941, htm. 1941, htm. A constant-restrictly filter system for de fam. 19, 1977, html/com/	en for decontaminat-
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US-PAT-NO: 4852385

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DOCUMENT-IDENTIFIER: US 4852385 A

TITLE: Maintenance

Maintenance device for at least partially automatic cleaning and calibration of a probe containing a measured value transmitter

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The control unit A3 is illustrated in FIG. 4 and contains control elements 94 and 96 for inserting and withdrawing the sensor 6, a control element 98 for switching on and off the tinse or cleaning system, a control element 102 for switching on and off the calibration program, a first request indicator 106 requesting the plu value to be set to, for example 4.01, an ACRNOWIEDGE control element 110, pneumatic indicators 111, 112, 113 and 115 from which the current status of the program course can be read, an LCD display 114 from which the instant value measured by the sensor 6 can be read, an alarm indicator 116 indicating the pH value, an aleaning water pressure, an amplifier 117 for setting the pH value, an aleaning vater pressure, an amplifier 117 for setting the pH value, an aleaning or cleaning water pressure, an amplifier 117 for setting the pH value, an aleaning or cleaning vater of the storage vassel or container 60 and/or 62, a CALIBRATION control element 120, a pneumatic CALIBRATION indicator 121, a multipole coupler creasponding to C3.1 in PIG. 1 and comparible with the multipole coupler C:sub.1 of the measured value transmitter unit A1, a multipole coupler

11 Claims, 4 Drawing Sheets

204/408, 433, 403, 1 H, 1 T

Field of Search

198

Detailed Description Text - DETX (9):

fluid medium to be investigated, as well as a control element 128 for switching from automatic temperature compensation.

not-illustrated temperature compensation resistance which is located in the

the temperature compensation resistance 24 and a further

central process control unit. In add the two separate inputs which are not

connection with

In addition, the control unit A3 is re not illustrated in the Figure, for

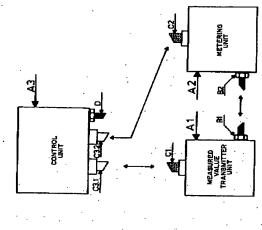
corresponding to C 3.2 in PIG. 1 and compatible with the multipole coupler C2 of the metering unit A2, and a signal output corresponding to D in PIG. 1 and which signal output D can be coupled to a central compressed air supply or an

In the construction of the heretofore described control unit 43, all or most of the control elements are designed as push buttons. The color of indication is blue, with the exception of the MEASUREREM indication which appears in green. The alarm indicators indicating insufficient rinsing or cleaning water pressure and/or an inadequate filling state of the first and second storage vessels or containers 60, 62 for the buffer solutions appear red. Further details in this respect follow further hereinhelow in the description of the operation of the

Detailed Description Text - DETX (12):

The rinsing or <u>cleening</u> operation is started by actuating the control element 98 which constitutes a toggle switch in the illustrated embodiment. The calibrating operation is started by actuating the control element 102 which constitutes a toggle switch in the illustrated embodiment. The directional water control valve 36, which is set to rinsing or <u>cleaning</u> duration of about 1

5	nited Sta	United States Patent [19]	[11]	[11] Patent Number: 4,852,385
E	Brinkmann		[45]	[45] Date of Patent: Aug. 1, 1989
<u>*</u>		MAINTENANCE DEVICE FOR AT LEAST PARTIALLY AUTOMATIC CLEANING AND CALIBRATION OF A PROBE CONTAINING A MEASURED VALUE TRANSMITTER	[56] 3,625 4,260	References Glod U.S. PATENT DOCUMENTS \$4524.80 1.15791 Arthory and \$452.80 1.701 Arthory at \$1.70 P.
[73]	Inventor He	[75] Inventor: Heins J. Brinkmann, Frankfurt am Main, Fed. Rep. of Germany		2861/9 2861/9
Ē	[73] Assignee: Dr. Sw	Dr. W. Ingold AG, Urdorf, Switzerland	รี่สีสั	2514193 1/1976 Fed. Rep. of Germany
[2]	[21] Appl. No.:	15,859	3	114139 9/1978 Fed. Rep. of Germany . 3115771 11/1982 Fed. Rep. of Germany .
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	§ 102(e) Date:	Jen. 27, 1987	Anomey	frimary Examiner—10m Noland Anamey, Agent, or Firm—Wenner W. Kleeman
[87]	[87] PCT Pub. No.: PCT Pub. Date:	PCT Pub. No.: WOS6/70151 PCT Pub. Date: Dec. 4, 1986	The com	(57) ABSTRACT The combination of a measured value transmitter unit, a
<u>S</u>	Foreign Ap	pilication Priority D	measures process n	metering unitative bound in the chances an institutionalize measures which become necessary during the course of process monitoring, to be carried out with little expen-
Ma	May 30, 1985 [CH]	Switzerland	diture of	diture of labor and time and without removing the sen- sor from the container containing the measured me-
<u>5</u>	Int. Cl.4	[51] Int. Cl. ⁴	dium. In	dium. In addition, this combination, in which all tunc- tions necessary for carrying our the maintenance can be
[22]	US. C	[52] U.S. C	Initiated	nitiated and/or controlled by pneumatic signals, per-
		2014 VPC42		une et rent par uel automation di une maintenance.



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DETX (114): Description Text -

that the desired, or acceptable state process, and the flow control valve is fluid supply, either regulated of war mregulated, when the flow control valve is closed and the gun is turned off, is 800 pai, and high and low static pressure in 'init and a static pressure in 'init and a static pressure in the static pressure comprised of a predetermined number, for example, 64 pressure samples. Assume that the desired, or acceptable static pressure, that is, the pressure from the indicators are produced as will be subsequently described as a function of comparing the measured static pressure to the high and low static alam limits. The monitor subroutine then counts the occurrences of the various static pressure quality indicators during the sampling period and produces fluid flow condition signals as a function of comparing the frequencies of occurrence of subroutine 406 detects fluid pressure conducted to the spray gun to generate various error codes and/or messages. Referring to FiG. 11, during the monitor subroutine, pressure downstream from the oritice 104 is sampled by the transducer 132 during the ON and OPP times over successive sampling periods and if there is no data alarm limits are set at 835 psi and 765 psi, respectively. The static pressure is sampled during the gun OFF time, and high and low static pressure quality Fluid flow condition data is also created by measuring the average-static pressure during the sampling period and compar<u>ing it to the r</u>eference static static pressure quality indicators to predetermined reference values. The monitor received at 404, the monitor subroutine 406 is executed. error codes as detected at 402, pressure value In the

Detailed Description Text - DETX (115):

pressure is 800 psi. Therefore, the normal, or set firing pressure, that is, the pressure drop across the nozzle of the sprey gun 30, will be 750 psi. High alarm ("HA"), high warning ("HA"), inw warning ("HA") and law alarm ("HA"). Dressure limits, or pressure reference values, for the firing pressure may be set at 780 psi. 755 psi. 735 psi and 700 psi. Respectively. Those limits will respective pressure drops across the orifice 104 of 20 psi. 35 psi, 65 psi and 100 psi. As will subsequently be explained, during an ON time þe assume that the indicators are produced if the sampled firing pressure sampling period to the various alarm and warning pressure limits. Some fluid flow condition signals represent alarm conditions which, by design, require immediate attention and are operative to provide immediate remedial action. indicators are used to produce Error codes are also produced Other fluid flow condition signals represent warning conditions which should sampling process runs continuously during the spray gun ON and OFF times period includes sixty four samples, and the monitor control produces various firing pressure quality indicators as a function of comparing sampled fluid frequency of occurrence of the low alarm, low warning, normal flow, high With reference to PIG. 11, during the spray gun 30 CM time, assume that a normal fixing pressure drop across the orifice 104 is 50 psi and the static Each occurrence of the same type of is either, in excess of the alarm limits, or between the warning and alarm limits, or between the warning limits. Bach occurrence of the same type of firing pressure quality indicator during the sampling period is counted, an sampling period, the monitor subroutine samples the fluid pressure of the coating material over continuously occurring sample periods. Each sample period includes sixty four samples, and the monitor control produces varie For example, different types of as a function of comparing the average pressure value measured over the werning and high alarm firing pressure quality indicators werning and alarm error codes to the operator. Error cod regardless of the duration of the ON and OFF times. pressures to the firing pressure limits. pressure quality firing

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COATING ASSEMBLY WITH PRES SENSING TO DETERMINE NOZZL CONDITION Z

Inventors: Jeffrey M. Buckler. Brookfil. Harald Please, Gauteng, So. Daniel Pinault, Noisiel, Fra 75

Assignee: Nordson Corporation, West Ē

Aug. 5, 1996 Appl. No.: 693,897 Filed [Z]

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Related U.S. Application Data

Continuation-in-part of Ser. No. 632,351, Apr. 10, 1996, absendenced.

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118/717; 239/68; 239/71; 239/12, 459/12, 459/12, 459/12, 459/12, 459/68; 118/31; 712; 137/599; 73,71; 00, 714, 861,42; 239/68; 71, 74, 124, 127, 600 Pield of Search US CL [52] 28

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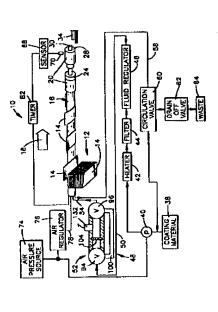
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Attorney, Agent, or Firm-Twelli, Sundhelm, Covell.

ABSTRACT

tracuph a main conduit. A mondine assembly, in the main conduit includes a housing having an infex valve and an outlet valve. An artifice is disposed within the bousing between the index and outlet valves. A transducer senses find pressure downstream from the ordice. The inlet and outlet raives are operable to direct the centing material flow to and from a hypass conduit. This easibles the ordine nagfor the anadores to be regained or replaced without interrupting operation of the coating assembly. In one embodiment of the receiving the monitor assembly is disposed abead of the veiding assembly and coating assembly. In another embodi-nosit of the liveration, the monitor assembly is disposed envecen the veiding assembly and the conting assembly. A abye in a coating material veture conduit may be closed aring the coating of cans and be open when the coating of us is interrupted. ceam in a tubular can body. A costing essembly applies costing material to an inner side surface of the seam Coaring material is conducted to the coating assembly An apparatus includes a welding assembly which forms

42 Claims, 6 Drawing Sheets



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Apparatus and method for water flow fire alarm

TITLE:

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. 4 the system incorporating the features disclosed herein. The FIG. 13 is an MPS system, but it could be that instead of nestic demands, the system could simply supply fire protection water supply means 10 supplies water through a gate valve 12 and a water meter 14 to the exterior wall 16 of the structure. The water enters the system valve through a main control valve 18. Preferably, as shown, the main control valv 18 will have a tamper protection means 158 for determining whether the valve first Reed switch 146 is the same as proviously disclosed, and enunciates a fire alarm via the fire alarm means 26. Preferably, the Reed switch 146 also activates a system which contacts emergency response personnel, such as fire indicating by displacement of the moving orifice plate 134, not shown. The a combination closed, and if so, enunciating a trouble alarm. A pressure gauge is also preferably provided in the system. Water then flows through a combination The sensor 128 in which case it would be more like a standard sprinkler system. orifice flow meter/displacement magnetic flow sensor 128. The sensor 12 has two normally open Reed switches disposed thereon for detecting flow Description Text - DETX (23): domestic demands, shown in FIG. shows incorporating Detailed FIG.

activate the first stage Reed switch 160, enunciating the internal first stage trouble alarm 162. As the oritice plate 1314 continues to be displaced towards the outlet end 156, it will now active the fire alarm Reed switch 146, which enunciates the alarm means 26, preferably notifying emergency response ward the inlet 154 of the flow sensor 128. Thus, as the moving orifice plate displaces towards the outlet end 156 of the flow sensor 128, it will first re alarm to give residents or occupants of the structures to off domestic demands before a fire alarm is created. The delta "d" (i.e., the linear displacement of the fire alarm Reed Le usage is excessive. Where the system is used with an MPB, the first larm will cause anyone in the residence to instinctively shut off water, umple a shower they may be taking. As another example, if a resident first stage alarm, and they were washing dishes, they will most likely the same faucet. This natural reaction to the first This two-stage system also serves as a safety back up, because if one of the alarm is created. This two-stage system also serves as a safety back up, because if one of the alarm stages fail, the other will still alert residents to the potential alarm condition. switch 160 enunciates a first stage trouble alarm 162. Preferably, the first stage trouble alarm 162 is only enunciated within the structure (i.e., emergency response personnel are not contacted) The alarm is created when the shut off the sink faucet. This natural reaction to the first stage alarm may reduce the water flow demand below the level where the first stage alarm the departments. In addition to the fire alarm Reed switch 146, the present invention incorporates a first stage Reed switch 160. The first stage Reed enunciates, eliminating the alarm condition. As can be seen in FIG. 13, the first stage Reed switch 160 is displaced a slight distance, shown as delta will be set in the field ow which activates the witch 146 and the first stage Reed switch 160) that there is sufficient differential in the stage alarm and the first sufficient time to shut exemp oersonnel hears a state

United States Patent Young (22)

US 6,333,689 B1 Dec. 25, 2001 (45) Date of Patent: Patent No.: 9

> APPARATUS AND METHOD FOR WATER FLOW FIRE ALARM **₹**

73/861.58

Methugh Carmichael Holden Swinson et al.

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Martin et al.

Inventor: Richard Young, 9709 Winding Oak
Dr., Oklahoma City, OK (US) 73151

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Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days. Notice:

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Retard), p 1-2, Dec. 1995.*

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Appl. No.: 09/450,535 ਰ Nov. 30, 1999 Filed:

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Related U.S. Application Data

Primary Examiner—Domic L. Crosland (74) Assormey, Agent, or Firm-Edward L. White

ABSTRACT

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Continuation in part of application No. 09/098,976, filed on Jun. 17, 1998, now Pat. No. 6,081,196.

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... G08B 29/00; G08B 21/00; Et.C., 340/306; 340/606; 340/601; 137/87.04; 137/544; 169/37; 169/61; 116/267 340/607–611, 618; 137/115.01, 115.05, 116.5, 87.04, 87.03, 544; 169/23, 60, 61, 90, 37; 116/264, 267, 268 340/506, 606, Field of Search U.S. C. 33 86

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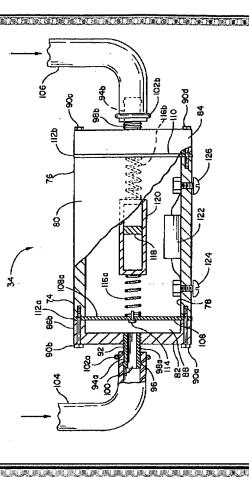
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fire alarm. A through the system becomes too great. Flow detection means are also provided with minimal pressure drop to insure that flow for fire protection need is not unduly An apparatus and method for a flow-based fire alarm, A bypass system is provided to allow sufficient water flow encountered, by providing an alternate, lower pressure flow path allowing additional flow when the pressure drop pressure switch coupled to an orifice plate or a municates with a Reed switch in proportion to the flow therethrough. An integral system incorporating all of the elements discussed provides multiple levels of security for a fire protection system for use in a residence or other strucwhere a pressure drop, particularly in a residential or multimoving orilice plate having thereon a magnet, which comrestricted. The flow detection means includes either a difpiping system such as a water softener purpose

8 Claims, 8 Drawing Sheets

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us 4029114 1029114 DOCUMENT-IDENTIFIER: US-PAT-NO:

Back filter automatic vehicle wash water reclaim system

TITLE:

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ç A pressure sensor 130 is connected to the discharge of the rinse pump 33 tense the pressure thereof and turn such pump off and turn on an audio and visual alarm when the pressure drop thereacross falls below a predetermined level to thereby indicate clogging of the filter 127 and inadequate pressure and flow for the system to operate properly. ailed Description Text - DETX (12):
A pressure sensor 130 is connected Detailed

Current US Class - CLAS (1):

States Patent [19]

4,029,114

June 14, 1977

[45] Ξ

FILTER AUTOMATIC VEHICLE WATER RECLAIM SYSTEM

Primary Examiner—Robert L. Blautte Attorney, Agent, or Firm—Pulwider Patton Rieber Loe & Utecht

ABSTRACT

[37]

Apr. 26, 1976

Appl. No.: 680,216 U.S. CL.

[21] (32) 2<u>8</u>

provide for filter flow in a forward direction through a pair of each tanks and will then provide for reverse flow of the entire flow volume in reverse direction through a single filtering tank to thereby back weak such filtering tank. system of the present invention is adapted for receiving their water from an automatic car wash bay and includes a plurality of pairs of back wash filter traits which are connected together in a manner which will The back filter automatic vehicle wash water reclaim

134/104; 134/109; 134/123; 210/108 B08B 3/02

5 Chains, 1 Drawing Figure

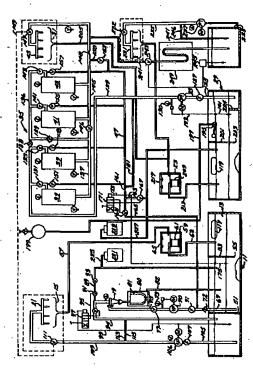
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US 4964363 A DOCUMENT-IDENTIFIER:

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System of assembly and filling large cables in a single pass at a single station

The operator then installs the splash guards 122, 124 and the front sheet metal doors 180 of the single pass filling tenk are closed (FIG. 2). The three pumps 108, 110, 112 are now switched to "Forward" with selector switches 126 and bell and light pressure alarms 182 are switched "on" with selector switches 184. The bell and light pressure alarms 182 are electrically interconnected with the pressure (quage 96, 96 One pressure alarms 187 are pectrically interconnected the pressure of the pressure of the pressure in the pressure and the pressure in the pressure in the pressure in the pressure and interstices of the cables 12 are the spaces between the insulated conductors of the cables, that is, the spaces between the insulation diameters that have copper conductors at their cores. tube 42. The pressure alarms 182 will remain activated until a minimum of 14 psi pressure is attained in the pressure chamber 40 and 26 psi pressure in the pressure tube 42. When the alarms 182 deactivate the operator knows that the chamber 40 and pressure tube 42 and then will visually check to see that hot filling campound is flowing from the pressure relief valves 104 found at the top of the pressure chamber 40 (PiG_c 6). The pressure relief valves 104 are to open at 10 psi pressure and the filling compound flowing through them way the air that has been purged from the interstices of the unit and replaced with hot filling compound under pressure. The proper minimum filling compound pressure has been attained in the pressure The pressure relief valves 104 cables 12

Current US Class

CLAS (3): Current US Class 427

Patent Number:	Date of Patent:
1111	[45]
States Patent [19]	
United S	Patel et al.

SYSTEM OF ASSEMBLY AND FILLING LARGE CABLES IN A SINGLE PASS AT A SINGLE STATION

3

Inventors: Pursan M. Patel, Rock Hill, S.C.; ... Bruce G. Keemer, Waxbaw, N.C.

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Essex Group, Inc., Fort Wayne, Ind. Assignee

Jun. 6, 1989 Appl. No.: 362,173 Fled

156/56, 156/148, 427/117, 427/120 Search 156/148, 427/117, 427/120 264/174, 427/117, 120; 118/405, 425/93 Int. C. [38] 医医冠唇

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[99]

Field of Search

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Primary Examiner—Robert A. Dawson Attorney, Agent, or Firm—Mark F. Smith ABSTRACT 5

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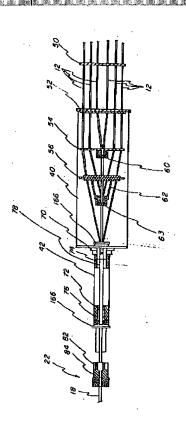
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4,964,363

Oct. 23, 1990

which the unfilled small pair count unit cubbs are filled with filling compound and the plurality of unit cabbs eare converged cabs eat the a presistor taken shows a stream that the whore addition converged cabic cates into a presistor the whore addition of things compound as at least shightly higher pressure is applied thereto. The assembled and filled large cable is then A system and a method for converging and filling unfilled small unit cables into a single large cable in a wiped of excess filling compound, wrapped, bound and collected on a take up reel. stugle pass at a single station is disclosed. The sing pass filling station comprises a pressure chamber

9 Cladars, 7 Drawing Sheets



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ENTIFIER: US 6274009 B1 for Certificate of Correction** DOCUMENT-IDENTIFIER: .* See image

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Generator for generating chlorine dioxide under vacuum sduction in a single pass

67 6

Text

shows the input line (1) is for the motive water feed. On/off valve PIG.

(2) controls for the motive water feed. Pressure (<u>Gauge</u>)(3) and pressure switch (4) monitoring the motive water pressure and provide—an alam alignal for undesirable pressure conditions. Conduit line (5) runs from pressure switch (4) to the electrical panel shown in FIG. 6. Solenoid (6) is connected to motive water line (1). Conduit line (7) runs from solenoid (6) to the electrical panel shown in FIG. 6. Union (8) joins the catholyte eductor (9) and anolyte eductor (10). Eductor (9) and (10) create sufficient vacuum to draw the catholyte and anolyte flows through the electrochemical cell. Inline ball check valves (11) and (12), respectively, prevent back flow through eductors (9) and (10). Catholyte and anolyte effluents are educted from the electrolytic cell through plastic tubings (13) and (14), respectively. The anolyte effluent tubing (14) progressively ascends, with no back looping or horizontal sections, to the inlet of anolyte eductor (10) so as to minimize the e present on the catholyte and anolyte tubings (13) and (14), respectively, prevent back flow through the electrolytic cell and prevent inadvertent over standic pressurization of the cell. Optional sample taps are typically cated on the catholyte and anolyte discharge lines as illustrated. Non-corrosive check valves (15) and (16), respectively, Such pockets are formation of gaseous pockets of chlorine dioxide. potentially explosive. are present hydraulic possible located

Current US Class - CLAS (1): 204

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United States Patent Krafton et al. (22)

(45) Date of Patent:

US 6,274,009 B1

(10) Patent No.:

Aug. 14, 2001

GENERATOR FOR GENERATING CHLORINE DIOXIDE UNDER VACUUM EDUCTION IN A SINGLE PASS <u>8</u>

Brian D. Krafton, Wakefield, RI (US); John C. Smedley, Platte Woods, MO (US) Inventors: ઈ

423473 204/230.5 X 204/257 204/257 X

FOREIGN PATENT DOCUMENTS

12/1952 (GB). 12/1981 (JP).

714828

International Dioxide Inc., North Kingston, RI (US) Assignee: Ê

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days. Notice: ε

Appl. No.: 09/389,335 <u>a</u> Sep. 3, 1999 Filed: 8

C25B 15/00; C25B 11/00; C25B 11/04 Int. Ci.' (51)

204/290 R; 204/290 F; 204/293 204/284, 290 R, 290 F, 293 Field of Search (52) U.S. Ct. 88

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Kelley; рá (74) Attorney, Agent, or Firm-Muguet Clifford Chance Rogers & Wells, 11P Primary Examiner-Donald R. Valentine

ABSTRACT

resistant highly conductive cathode, and a cation ion exchange membrane between the anode and cathode. An eductor is used on the anolyte effects line to create a vacuum and draw the anolyte through the cell. Preferably, an from the cell to the anode eductor. Sensors are used to monitor the composition of the molyte effluent and/or the A vacuum operated electrolytic generator producing a solu-tion of chlotine dioxide from a buffered aqueous alkali metal eductor is used n the catholyte effluent line. Ascending anolyte officent line with a non-corrosive check valve leads chlorite solution in one pass through the cell is disclosed. The cell contains a high surface area anode, a corrosion-

19 Claims, 9 Drawing Sheets

